

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

UNITED STATES OF AMERICA,

v.

SUNG KOOK (BILL) HWANG and
PATRICK HALLIGAN,

Defendants.

22 Cr. 240 (AKH)

**DEFENDANT SUNG KOOK (BILL) HWANG'S
MOTION TO EXCLUDE PROPOSED EXPERT TESTIMONY OF ROBERT
BATTALIO, AMIT SERU, CARMEN TAVERAS, AND JOSEPH MASON**

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PRELIMINARY STATEMENT

This prosecution is the most aggressive open market manipulation case ever pursued. To close gaping holes in their evidence and compensate for their incomprehensible manipulation theory, the prosecution has now identified four separate experts to present an array of improper, unfair, and inadmissible testimony. Couched as “expert opinions,” much of the testimony is a transparent effort to testify about the defendant’s state of mind, invade the province of the Court, or serve as an obvious substitute for missing fact witness testimony. Other testimony consists of subjective opinions lacking any hallmarks of reliability. And much of the proposed testimony is based on the wrong documents entirely: rather than seek execution data on the hedges from the Counterparties, the supposed experts have engaged in guesswork to try to match Archegos’s swap orders with market data.

This improper testimony must be excluded for the myriad reasons discussed below.

First, the prosecution cannot solve their lack of evidence of manipulative intent through expert testimony. To counter the evidence establishing Mr. Hwang’s innocence, two of their experts propose to review Archegos’s trades, without any context, and testify that the “strategy” behind Archegos’s orders was “consistent with a strategy to influence market prices.” *See Declaration of Jordan Estes, Exs. A (Expert Disclosure of Robert Battalio (“Battalio Disclosure”)) and B (Expert Disclosure of Amit Seru (“Seru Disclosure”)).* This speculation is improper and inadmissible, because it is well-established that “[i]nferences about the intent or motive of parties or others lie outside the bounds of expert testimony.” *In re Rezulin Products Liab. Litig.*, 309 F. Supp. 2d 531, 547 (S.D.N.Y. 2004). Whatever expertise they may possess, these experts have no insight into Mr. Hwang’s state of mind or why he ordered certain trades. Their conjecture on these issues must be excluded.

Second, the proposed expert testimony on the stock declines in the months after the charged conspiracy lacks proper foundation and is irrelevant and unduly prejudicial. Two of the prosecution’s experts propose to link the stock declines in the months after Archegos’s collapse with Archegos’s conduct. But under Second Circuit precedent, such testimony is improper absent an event study excluding other factors that contributed to any price decreases. *See United States v. Ferguson*, 676 F.3d 260, 274-75 (2d Cir. 2011). Moreover, as the U.S. Attorney’s Office argued in a recent market manipulation case, “[a]fter-the-fact price evidence is irrelevant and highly likely to mislead the jury.” *See* Prosecution Mot. *in Limine* at 12, *United States v. Phillips*, No. 22 Cr. 138 (LJL) (S.D.N.Y. Sept. 29, 2023, ECF No. 41). In addition, allowing such evidence would require a mini-trial on what *actually* caused the price declines, which would unduly lengthen the trial and confuse the jury. Accordingly, it should be excluded.

Third, much of the testimony is mere conjecture, lacking any disclosed methodology. For example, one of the experts proposes to testify that Archegos made “uneconomic trades” during 2020 and 2021. Seru Discl. ¶ 11.C. The testimony is not based on a formal, recognized methodology or technique to determine what makes a trade economic; nor is it grounded in his experience in trading or portfolio management, because he has none. Instead, he apparently developed this bespoke testimony solely to support the prosecution’s case. As detailed below, much of the other testimony is similarly flawed and should be excluded.

Fourth, the testimony purporting to connect Archegos’s swap orders with transactions in the equities markets is a speculative guessing game that lacks foundation. The prosecution had the ability to obtain hedging execution data from all of the Counterparties to link Archegos’s swaps with transactions in the equities markets. But they chose not to do so, and they have opposed the defense’s efforts to obtain this information through Rule 17 subpoenas. They

cannot overcome this glaring evidentiary problem by having an expert eyeball market data and purport to connect it to Archegos’s swaps.

Fifth, the prosecution has completely failed to meet its disclosure obligations for much of the testimony, including testimony based on elaborate calculations and analysis. *See* Fed. R. Crim. P. 16(a)(1)(G)(iii). For example, the Battalio Disclosure references a “vector auto regression” analysis and a “probit regression analysis,” but the prosecution has failed to disclose such analyses to the defense. Similarly deficient, the disclosures repeatedly state that testimony will be based on specific trading days, and on specific trading instances during those days, but the prosecution has disclosed none of those dates or times to the defense, thereby concealing from the defense the actual swap or trade transactions addressed by the proposed expert opinions. And finally, the Seru Disclosure claims to be largely based on academic literature, but the prosecution has neither cited nor produced any literature underlying his testimony. These failures have left the defense unable to evaluate whether there are additional arguments for the preclusion of the testimony under Rule 702 of the Federal Rules of Evidence (“Rule 702”) and *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 597 (1993), or to rebut the proposed analysis and testimony.

Finally, the core opinions of all the prosecution’s experts relate to price impact, which is of limited probative value and raises a significant danger of unfair prejudice through misleading argument and innuendo. Price impact is not market manipulation. *See Set Capital LLC v. Credit Suisse Group AG*, 996 F.3d 64, 77 (2d Cir. 2021) (open-market activity “is not, by itself, manipulative—even when it occurs in high volumes and even when it impacts the market price for a security”). Rather, market manipulation requires the intent to create a “false signal” – to show interference with the legitimate forces of supply and demand. *ATSI Commc’ns, Inc. v.*

Shaar Fund, Ltd., 493 F.3d 87, 100 (2d Cir. 2007) (market manipulation disrupts supply and demand by “send[ing] a false pricing signal to the market”). A large buyer in the market does no such thing.

The prosecution’s expert notices reflect their effort to muddle this fundamental point. They propose calling a host of experts who will harp on one thing that hardly matters: whether Archegos’s large swap transactions affected the price of stock. But to the extent Archegos’s swaps may have led to hedging demand that was greater than the supply in the market, prices, of course, would organically increase. That’s how supply and demand works. However, a large buyer’s demand doesn’t reflect a “false signal,” and to suggest otherwise through expert testimony would be misleading and improper.

As a result, much of the prosecution’s proposed expert testimony on price impact is irrelevant and unduly prejudicial. By emphasizing over and over again that Archegos’s swaps moved the stock price, the prosecution apparently intends to conflate price impact and market manipulation. Allowing multiple experts to opine on this issue will sow jury confusion on whether price impact is manipulation, give it outsized importance, and unnecessarily extend the length of trial by requiring extensive rebuttal.

Accordingly, the Court should exercise its gatekeeping function to exclude the prosecution’s improper proposed expert testimony.

LEGAL STANDARD

Federal Rule of Evidence 702 provides that “[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if” the party offering that witness can prove by a preponderance of the evidence that (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient

facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert's opinion reflects a reliable application of the principles and methods to the facts of the case." *See Fed. R. Evid. 702; United States v. Williams*, 506 F.3d 151, 160 (2d Cir. 2007). The district court serves a "gatekeeping role" to "ensur[e] that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." *Daubert*, 509 U.S. at 597.

An expert may only testify to matters within his or her expertise. "To determine whether a witness qualifies as an expert, courts compare the area in which the witness has superior knowledge, education, experience, or skill with the subject matter of the proffered testimony." *United States v. Tin Yat Chin*, 371 F.3d 31, 40 (2d Cir. 2004). "Testimony on subject matters unrelated to the witness's area of expertise is prohibited by Rule 702." *523 IP LLC v. CureMD.com*, 48 F. Supp. 3d 600, 642 (S.D.N.Y 2014) (internal citations and quotation marks omitted). Put simply, an expert does not have "carte blanche to opine on every issue in the case." *Davis v. Carroll*, 937 F. Supp. 2d 390, 413 (S.D.N.Y. 2013).

An expert may not, however, "usurp either the role of the trial judge in instructing the jury as to the applicable law or the role of the jury in applying that law to the facts before it." *United States v. Lumpkin*, 192 F.3d 280, 289 (2d Cir. 1999). This includes expert testimony concerning a defendant's mental state, which "poses a uniquely heightened danger of intruding on the jury's function." *United States v. DiDomenico*, 985 F.2d 1159, 1164 (2d Cir. 1993). Inferences about the intent or motives of parties also "lie outside the bounds of expert testimony" because they "have no basis in any relevant body of knowledge or expertise." *Rezulin*, 309 F. Supp. 2d 531, 546-47; *see also In re Fosamax Products Liab. Litig.*, 645 F. Supp. 2d 164, 192 (S.D.N.Y. 2009) (expert witness who "conceded at the hearing that her regulatory expertise does not give her the ability to read minds" precluded from testifying to the "knowledge, motivations,

intent, state of mind, or purposes" of others). Were there any doubt, Rule 704 is explicit that, "[i]n a criminal case, an expert witness must not state an opinion about whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense. Those matters are for the trier of fact alone." Fed. R. Evid. 704(b).

Proffered expert testimony must also be "the product of reliable principles and methods" that are "reliabl[y] appli[ed] . . . to the facts of the case." Fed. R. Evid. 702. To satisfy this requirement, "it is critical that an expert's analysis be reliable at every step," and "any step that renders the analysis unreliable under the *Daubert* factors renders the expert's testimony inadmissible." *Amorgianos v. Nat'l R.R. Passenger Corp.*, 303 F.3d 256, 267 (2d Cir. 2002) (internal citation and quotation marks omitted). In short, this Court must "mak[e] certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Nimely v. City of New York*, 414 F.3d 381, 396 (2d Cir. 2005) (internal citation and quotation marks omitted). "[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence which is connected to existing data only by the *ipse dixit* of the expert." *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

Expert testimony must therefore "be excluded if it is speculative or conjectural." *Boucher v. U.S. Suzuki Motor Corp.*, 73 F. 3d 18, 21 (2d Cir. 1996); *see also Clarke v. Travco Ins. Co.*, No. 13 Civ. 5140 (NSR), 2015 WL 4739978, at *5 (S.D.N.Y. Aug. 7, 2015) ("Rule 702 requires that expert testimony rest on knowledge, a term that connotes more than subjective belief or unsupported speculation.") (internal citation omitted). In such a situation, "[a] court may conclude that there is simply too great an analytical gap between the data and the opinion proffered." *Gen. Elec. Co.*, 522 U.S. at 146; *see also United States v. Zafar*, 291 F. App'x 425,

427 (2d Cir. 2008) (upholding district court’s exclusion of expert testimony as “well within its discretion” where testimony lacked a “critical missing link” for relevance).

“In addition to the requirements of Rule 702, expert testimony is subject to Rule 403, and ‘may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury.’” *Nimely*, 414 F.3d at 397 (citing Fed. R. Evid. 403). Rule 403 plays a “uniquely important role . . . in a district court’s scrutiny of expert testimony, given the unique weight such evidence may have in a jury’s deliberations.” *Id.*

Finally, Federal Rule of Criminal Procedure 16(a)(1)(G), as amended in 2022, requires the prosecution to disclose for each expert witness “a complete statement of all opinions that the government will elicit from the witness in its case-in-chief” and “the bases and reasons” for each of these opinions. Fed. R. Crim. P. 16(a)(1)(G)(iii). The 2022 Amendment was “intended to facilitate trial preparation, allowing the parties a fair opportunity to prepare to cross-examine expert witnesses and secure opposing expert testimony if needed.” Fed. R. Crim. P. 16, Notes of Advisory Committee on Rules—2022 Amendment. As under Rule 702, an expert “opinion’s bases and reasons cannot merely be ‘the *ipse dixit* of the expert’ from experience.” *United States v. Mrabet*, No. 23 Cr. 69 (JSR), 2023 WL 8179685, at *2 (S.D.N.Y. Nov. 27, 2023) (expert opinion based merely on expert’s “training, education, and experience” constituted “a patent evasion of the Rule’s requirements”).

ARGUMENT

The prosecution’s four expert disclosures propose cumulative, overlapping testimony that suffers common deficiencies. *See* Battalio Decl.; Seru Decl.; Disclosure of Carmen Taveras (“Taveras Disclosure”), Estes Decl. Ex. C; Disclosure of Joseph Mason (“Mason Disclosure”), Estes Decl. Ex. D. The following core issues pervade multiple expert disclosures.

First, although cloaked as expert testimony, many of the opinions are merely testimony about the defendant’s intent. For example, no less than three experts propose to opine that the “strategy” Archegos employed when building its positions was consistent with an effort to influence stock prices. Battalio Discl. ¶ 7; Seru Discl. ¶ 11; Mason Discl. ¶ 9. But the experts are not mind readers; they have no knowledge on *why* Mr. Hwang ordered swap transactions. On an issue where intent is the whole ballgame, allowing experts to opine on Mr. Hwang’s intent improperly invades the province of the jury and raises a grave danger of unfair prejudice.

Second, two of the proposed experts propose to opine, with no analysis, that the stock price drops after Archegos collapsed were caused by Archegos. Battalio Discl. ¶ 6.d; Taveras Discl. ¶ 9. But many factors can affect stock prices, and for that reason, the Second Circuit has held that testimony to this effect is improper without an event study excluding other factors that may have contributed to the price declines. *See Ferguson*, 676 F.3d at 274-75.

Third, the prosecution’s experts propose to “match” Archegos swap orders with market trades they speculate were hedges. But this matching analysis is simply guesswork because Archegos’s swap order records do not contain the information necessary to link them to trades in the market. Troublingly, the prosecution could have sought execution data from the Counterparties, but they failed to do so, and even more, they sought to block the defense from getting this data in their opposition to the Rule 17 subpoenas.

Fourth, although the disclosures reference a multitude of analyses, *see* Battalio Discl. ¶¶ 6.c, 6.e-g, 7.d.iii, 7.e, 7.g, 7.i-j; Taveras Discl. ¶¶ 4.J, 9; Mason Discl. ¶ 5, including a “probit regression analysis” and a “vector auto regression analysis,” the prosecution has failed to disclose any of these analyses, or even the inputs and variables used in the analyses, in violation of their Rule 16 discovery obligations. Equally problematic, although the disclosures reference

analyses of multiple trading days across a year-long timeframe, as well as analyses of specific trades on those days, the prosecution has entirely failed to disclose what days and times the experts have analyzed.

Fifth, much of the testimony lacks a reliable methodology and is outside the relevant expert's area of expertise. For example, Battalio and Seru offer identical, speculative testimony on what is "economically sensible" from a portfolio management perspective, *see* Battalio Discl. ¶ 7.a-b, Seru Discl. ¶ 11.A-B, when neither has industry or academic experience in portfolio management or offers any reason for their conjectural testimony other than "the simple logic of 'buy low, sell high.'" *See* Battalio Discl. ¶ 7.a; Seru Discl. ¶ 11.A.

Lastly, a glut of the expert testimony focuses on price impact. Battalio Discl. ¶¶ 6.c, 6.e-g, 7.b-c, 7.d.iii, 7.f-g, 8; Seru Discl. ¶ 11; Taveras Discl. ¶¶ 6-7, 9; Mason Discl. ¶¶ 8-9. But all trades can affect stock prices, and consequently, price impact does not equal manipulation. Inundating the jury with this testimony creates a high danger of unfair prejudice and juror confusion.

I. The Court Should Exclude Much of Professor Battalio's Proposed Testimony

Much of Battalio's proposed testimony in Paragraphs 4-8 of the Battalio Disclosure must be excluded under Rule 702 and *Daubert* for several reasons: (a) Battalio's proposed testimony regarding stock-price declines in the wake of Archegos's collapse lacks the foundation required under Second Circuit precedent; (b) Battalio's proposed investment-strategy opinions intrude on the jury's exclusive province to decide Mr. Hwang's mental state, are outside his purported areas of expertise, and are unsupported by any reliable principles or methods; (c) Battalio's price-impact opinions related to "Archegos-linked" orders are based on sheer guesswork, lack any reliable methodology, suffer from the prosecution's woefully inadequate disclosures, and are unfairly prejudicial because of the cumulative nature of this testimony; and (d) Battalio's opinion on the

price impact of adding or removing a stock from an index, such as the S&P 500, is wholly irrelevant and misleading.

A. Battalio’s Proposed Testimony on Stock-Price Declines Lacks Foundation and Is Misleading and Unfairly Prejudicial

Battalio proposes to testify that “stock price data in the months following Archegos’s collapse further evidences an explanatory relationship between Archegos’s orders in [certain stocks] and changes in prevailing stock prices for those securities.” Battalio Discl. ¶ 6.d. Battalio’s disclosure, however, fails to include an event study to estimate the extent of the stock-price drops attributable to Archegos’s collapse. *See United States v. Martoma*, 993 F. Supp. 2d 452, 458 (S.D.N.Y. 2014) (event study is necessary to analyze whether “events can be linked in a statistically significant way to variations in stock price”). Without such a foundation, Battalio’s proposed testimony is inadmissible under Second Circuit precedent. *See Ferguson*, 676 F.3d at 274-75.

In *Ferguson*, the Second Circuit vacated the defendants’ criminal convictions, holding that the district court abused its discretion by admitting stock-price charts suggesting that the allegedly fraudulent transaction between AIG and Gen Re “caused the price of AIG shares to plummet 12% during the relevant time period.” 676 F.3d at 274-75. The Court found that the charts’ admission was “without foundation” because there had been no expert testimony excluding “confounding factors” that contributed to the price decrease. *Id.* at 275 & n.11 (citing *United States v. Schiff*, 538 F. Supp. 2d 818, 836 (D.N.J. 2008) (finding that prosecution expert’s testimony was not relevant because expert’s event study failed to control for certain confounding factors)). The charts unfairly suggested to the jury that the entire 12% stock-price drop was caused by the allegedly fraudulent transaction and “that stockholders were hurt—and hurt seriously.” *Id.* at 275.

The prosecution here proposes to have Battalio testify that the stock-price declines in the months following Archegos’s collapse “evidences an explanatory relationship between Archegos’s orders...and changes in prevailing stock prices for those securities.” Battalio Discl. ¶ 6.d. But Battalio has failed to undertake an event study or any other analysis that would exclude other factors that contributed to the declining stock prices. And there were many: the Viacom secondary offering depressed prices in Viacom,¹ an SEC announcement caused Chinese technology stocks to slump,² and the Counterparties’ fire sale of hedges contributed to stock price declines. Without a proper event study, the admission of Battalio’s testimony is improper, unfairly prejudicial and highly likely to mislead the jury into believing that those stock-price declines were due solely to Archegos’s swap transactions and that investors in those stocks “were hurt—and hurt seriously.” *Ferguson*, 676 F.3d at 275. The admission of the testimony would also require extensive rebuttal testimony to explain the other factors contributing to the decline, which could lengthen the trial substantially.

The prosecution is no doubt aware of the misleading nature and high likelihood of unfair prejudice that could result from such unfounded testimony. Indeed, the very office prosecuting this case recently stated in another market manipulation case that “[a]fter-the-fact price evidence is irrelevant and *highly likely to mislead the jury.*” See Prosecution Mot. in Limine at 12, *United States v. Phillips*, No. 22 Cr. 138 (LJL) (S.D.N.Y. Sept. 29, 2023, ECF No. 41 (emphasis added)). In any event, because the prosecution has offered no event study to support Battalio’s testimony regarding stock-price declines, his testimony must be excluded.

¹ <https://www.cnbc.com/2021/03/23/viacomcbs-stock-closes-down-9percent-company-says-itll-raise-3-billion.html>

² <https://www.reuters.com/business/us-sec-seeks-comment-holding-foreign-companies-accountable-legislation-2021-03-24/>

B. Battalio’s Proposed Investment-Strategy Opinions Intrude on the Jury’s Role, Are Outside His Areas of Expertise, and Lack any Reliable Methodology

1. Battalio’s Proposed Testimony Intrudes on the Jury’s Role to Decide Mr. Hwang’s Mental State

The Court must exclude the opinions in Battalio Disclosure ¶¶ 7, 7.a, 7.b, 7.g, and 8 because the “strategy” that Archegos used in building its investment portfolio is not a proper subject for expert testimony. Such testimony intrudes on the exclusive province of the jury to decide Mr. Hwang’s mental state when engaging in swaps and stock transactions. *Lumpkin*, 192 F.3d at 289 (expert may not “usurp . . . the role of the jury in applying [trial judge’s legal instructions] to the facts before it”); *DiDomenico*, 985 F.2d at 1164 (expert testimony regarding defendant’s mental state “poses a uniquely heightened danger of intruding on the jury’s function”). As Federal Rule of Evidence 704(b) makes clear, “[t]hose matters are for the trier of fact alone.” Purporting to know Mr. Hwang’s strategy is no different than purporting to know what was in Mr. Hwang’s mind. Such testimony “lie[s] outside the bounds of expert testimony” because it has “no basis in any relevant body of knowledge or expertise.” *Rezulin*, 309 F. Supp. 2d 531, 546-547; *Fosamax Prods.*, 645 F. Supp. 2d at 192 (commenting that expert did not have “the ability to read minds”). Simply put, the prosecution may not “tell the jury the defendant’s intentions through the mouth[] of” an expert witness. *United States v. Rahman*, 189 F.3d 88, 136 (2d Cir. 1999).

The prosecution must prove at trial that Mr. Hwang acted with the sole intent to deceive or defraud others by sending a false pricing signal to the market. *ATSI Commc’ns, Inc. v. Shaar Fund, Ltd.*, 493 F.3d 87, 100 (2d Cir. 2007); *United States v. Mulheren*, 938 F.2d 364, 368 (2d Cir. 1991). Battalio has no expertise in investment strategy generally, much less in Mr. Hwang’s specific investment strategies. Battalio did not work at Archegos and has no firsthand knowledge of the firm’s or Mr. Hwang’s investment strategies. Rather, Battalio merely reviewed

Archegos's order and execution records, Instant Bloomberg messages, and market trade data to "propound a particular interpretation of [defendant]'s conduct" that props up the prosecution's case. *LinkCo, Inc. v. Fujitsu Ltd.*, No. 00 Civ. 7242 (SAS), 2002 WL 1585551, at *2 (S.D.N.Y. July 16, 2002) (citation omitted) (alteration in original). Accordingly, the Court must exclude Battalio's proposed investment-strategy opinions.

For similar reasons, the Court must exclude Battalio's opinion that "by March 23, 2021, the prevailing prices of the Archegos Top Long Positions did not reflect the ordinary operation of supply and demand[.]" Battalio Discl. ¶ 8. Battalio could have come to this conclusion only if he presumed that Mr. Hwang had manipulative intent, because if Mr. Hwang's intent was otherwise, his demand for exposure to these stocks *was* part of the ordinary operation of supply and demand. *See Gurary v. Winehouse*, 190 F.3d 37, 45 (2d Cir. 1999) ("The gravamen of manipulation is deception of investors into believing that prices at which they purchase and sell securities are determined by the natural interplay of supply and demand, not rigged by manipulators."). As such, this testimony is inadmissible because it "does not aid the jury in making a decision, but rather attempts to substitute the expert's judgment for the jury's." *Rezulin*, 309 F. Supp. 2d at 541 n.23.

2. Battalio is Unqualified to Offer Opinions on Investment Strategy and Portfolio Construction and Management

This Court should exclude Battalio's opinions regarding investment strategy and building and managing portfolios for the additional reason that he is unqualified to offer them. *See* Battalio Discl. ¶¶ 7, 7.a, 7.b, 7.g, 8. As reflected in his curriculum vitae ("CV"), Battalio's teaching and research focuses on trading and order execution. *See* Battalio Discl., Appx. A. However, expertise in trading—which focuses on short-term price movements—is vastly different from expertise in portfolio management—which focuses on managing a large

investment portfolio over time.³ Battalio’s CV reflects no portfolio management experience: he has never worked at an investment firm, managed an investment portfolio, or taught or written about portfolio construction and management.

Notwithstanding his lack of relevant experience, the prosecution proposes to have Battalio opine that Archegos’s orders “were inconsistent with a strategy to build concentrated positions in [certain stocks] at the best available prices” and “consistent with a strategy to influence market prices” in those same stocks. Battalio Discl. ¶ 7. But his opinions are not based on any relevant investment firm experience, or recognized industry or academic methodology. Instead, they are limited to “the simple logic of ‘buy low, sell high’” and the “economically sensible strateg[ies]” that Battalio himself divines from that platitude. *See* Battalio Discl. ¶¶ 7a, 7b. At no point does he recognize—probably due to his lack of relevant experience—that investors may fill stock orders that risk market impact because they believe that the stock is undervalued and do not want to risk the price rising before the order is filled. *See* Part I.B.3 *infra* (discussing Counterparty algorithms that seek to balance this tradeoff). Although he may be qualified to opine about efficient order execution, his expertise does not extend to how investment firms weigh the costs and benefits of large stock purchases in building and managing their portfolios, and his opinions on Archegos’s investment strategy should be excluded on this basis alone. *See SEC v. Tourre*, 950 F. Supp. 2d 666, 679 (S.D.N.Y. 2013) (“Being a professional testifying expert in the financial area does not give an individual the qualification to opine in every financial area as to every type of analysis.”).

³ *See, e.g.*, “Trader vs. Portfolio Manager: Understanding the Differences in Trading and Investing,” New York Institute of Finance, available at <https://info.nyif.com/trader-vs-portfolio-manager-difference/>

3. Battalio’s Proposed Investment Strategy Opinions Are Not Supported by Reliable Principles or Methods

Battalio’s proposed opinions on investment strategy decisions are also flawed because they are not supported by reliable principles or methods. According to Battalio, the *sole* economically sensible strategy in trading is “to seek to minimize price impact.” Battalio Discl. ¶ 7.b. But he has no portfolio management experience to support this assumption, and he has done no research to support this assumption. Moreover, the literature he cites, which relates only to execution costs, does not support the assumption that the only sensible trading strategy is to minimize price impact. *See* Estes Decl. Ex. E. Quite the opposite: it recognizes the trade-off in filling an order quickly through a market order, which could result in price impact, and filling an order slowly through a limit order, which exposes the trader to the risk that the order will not be filled if the price rises. *See* Estes Decl. Ex. E at 38.

Indeed, Battalio’s opinions on this point are belied by the trading activities of other parties in this case. For example, Battalio proposes to testify that “if traders are selling, they typically aim to avoid having their trading push the market price down, avoid clearing outstanding orders on the trading platforms, and avoid making their intent to sell large volumes clear to the market.” Battalio Discl. ¶ 11.B. Under this rubric, much of the *Counterparties*’ trading at the end of March 2021 would not be economically sensible because they quickly sought to liquidate any hedges they held, which in turn drove down prices.

The algorithms marketed by the Counterparties further undermine Battalio’s proffered testimony. For example, a Bank of Montreal document discussing its algorithms recognizes the “trade-off between market impact and price risk,” *see* Estes Decl. Ex. F, consistent with the trade-off recognized by the paper cited by Battalio. Other Counterparty documents similarly recognize this trade-off. *See* Estes Decl. Ex. G (describing an algorithm that “[m]inimizes

shortfall ... by dynamically optimizing the trade-off between execution risk and market impact"); Ex. H (noting an algorithm that "explicitly optimiz[es] the tradeoff between price impact and opportunity cost"); Ex. I (noting an algorithm that optimizes "the trade-off between impact caused by aggressive trading and the downside risk due to market exposure"). In other words, an equally sensible trading strategy is to buy shares quickly to avoid the risk that the price increases before the order is filled. Accordingly, Battalio's testimony that the sole economically sensible strategy in trading is "to seek to minimize price impact," Battalio Discl. ¶ 7.b., is unsupported by any reliable principles or methods, and must be excluded.

C. Battalio's Proposed Testimony on the Price Impact of "Archegos-Linked" Orders is Based on Guesswork, Lacks any Reliable and Accepted Methodology, and Lacks Sufficient Disclosure

Judging from the prosecution's woefully inadequate disclosures, Battalio's analyses on the price impact of "Archegos-linked" orders are founded on sheer guesswork and lack any reliable and accepted methodology.

The prosecution proposes to have Battalio "associate[]" Archegos's swaps with equity transactions on the NYSE, the Nasdaq, and dark pools by "matching price, quantity, and order handling." Battalio Discl. ¶ 5. Several of his analyses are then based on these supposed "Archegos-linked orders." *See id.* ¶¶ 4.c-d, 6.c, 6.e-g, 7.d.iii, 7.e-f, 7.h, and 8. However, the trade blotter reflecting Archegos's swap orders (which comes from Bloomberg's Execution Management System and is referred to as "EMSX") does not contain the data needed to undertake this analysis. For example, the EMSX data reflects only Archegos's final order quantity, rather than the initial order quantity and any changes made thereto. Similarly, the EMSX data reflects only the final limit price, rather than the initial limit prices and any changes thereto. And finally, the EMSX data does not reflect the time when any hedging transactions were filled, or the number of transactions in the equities markets that were undertaken as a

hedge; it reflects only the first time a given Archegos swap order was placed with the Counterparty and the final quantity of Archegos's swap orders after all modifications. *See* Estes Decl. Ex. J. Given the limitations of this data, Battalio could not have reliably matched Archegos's swap orders with any hedging transactions in the equities markets.

More fundamentally, the stock transactions purportedly undertaken by the Counterparties as hedges are knowable, empirical facts. There is no need for Battalio's guesswork when the relevant data is obtainable.⁴ As the office prosecuting this case recently stated in another market manipulation case, "the best source for information about [a Counterparty's] hedging practices is a witness from [the Counterparty]." *See* Prosecution Daubert Motion at 23-24, *United States v. Phillips*, No. 22 Cr. 138 (LJL) (S.D.N.Y. Sept. 29, 2023), ECF No. 40. But incredibly, the prosecution never bothered to obtain this information and has opposed Mr. Hwang's efforts to obtain this information through Rule 17 subpoenas. *See* Opposition to Motion for Rule 17(c) Subpoenas at 15-16, ECF No. 84. Baseless speculation by an expert is no substitute for available empirical evidence, and this Court should not countenance the prosecution's belated effort to remedy their error. *Cf. . Beastie Boys v. Monster Energy Co.*, 983 F. Supp. 2d 369, 374-76 (S.D.N.Y. 2014) (precluding expert from testifying that substantial damages award was warranted in implied license case based on large settlement amount in similar case where there had "not been any discovery into that settlement" and the expert was "ignorant as to how that settlement came about").

The prosecution's failure to obtain this data undermines the reliability of all of Battalio's opinions premised on Archegos-linked orders—*i.e.*, trades Counterparties made to hedge

⁴ Indeed a few Counterparties have produced the relevant execution data, which contains the information missing from the EMSX data.

Archegos's swaps. *See* Battalio Discl. ¶¶ 4.c-d, 6.c, 6.e-g, 7.d.iii, 7.e-f, 7.h, and 8. Battalio repeatedly opines that Archegos swap orders resulted in stock price impact in one way or another (*i.e.*, micro-market price impact analysis or vector auto regression analysis), but the factual link for that conclusion is absent: he does not know whether or in what amount the Counterparties purchased or maintained stock to hedge Archegos swaps. Nor does he claim—because he cannot—that the Counterparties followed some uniform “industry practice” for hedging swaps. This failing cannot come as a surprise to the prosecution given the recent litigation in the *Phillips* market manipulation case. As the prosecution argued there: “Banks do not always hedge, or completely hedge, exotic FX options they sell. Even when they do, there is no uniform practice for how that hedging will work.” Prosecution Daubert Motion at 23, *United States v. Phillips*, 22 Cr. 138 (LJL), ECF 40.

Additionally, in each of Battalio’s opinions that Archegos’s swaps impacted the price of the reference stock (*i.e.*, Battalio Discl. ¶¶ 6, 6.c, 6.e-g, 7.d.iii, 7.h, 8), he fails to apply a methodology explaining how he reaches that conclusion. *See Riegel v. Medtronic, Inc.*, 451 F.3d 104, 127 (2d Cir. 2006) (“An expert opinion requires some explanation as to how the expert came to his conclusion and what methodologies or evidence substantiate that conclusion.”). At most, he refers to “micro-market price-impact studies,” “regression analyses,” “the price of levels of the Archegos Top Securities before, during, and after Archegos amassed significant exposure to those securities,” and “comparison of the price movements of the Top Archegos Securities relative to similar companies in the same sector or market as a whole,” but at no point does he describe the methodology in those analyses or how he applies it to the facts. Battalio Discl. ¶ 8.

Finally, Battalio's expert notice fails to meet the disclosure requirements of Rule 16. His disclosure states that he will present many complicated analyses to the jury: (1) a "vector auto regression analysis" that demonstrates a statistically significant relationship between Archegos's trading and changes in prevailing stock prices (Battalio Discl. ¶ 6.c); (2) three "micro-market price impact" analyses based on various data sources (*Id.* ¶ 6.e-g); (3) a summary of Archegos's trading on "specific days" that remain unidentified (*Id.* ¶ 4.b); (4) an analysis purporting to show that Archegos's executed trades in ways that were more likely to have price impact (*Id.* ¶ 7.d.iii); (5) "a comparative analysis" demonstrating that Archegos's active orders were larger and more aggressive than those of other market participants (*Id.* ¶ 7.e); (6) a "probit regression analysis" evaluating market conditions prevailing at the time when Archegos increased order sizes (*Id.* ¶ 7.g); and (7) an analysis demonstrating that Archegos acquired its positions inefficiently (*Id.* ¶ 7.i-j). But the prosecution has failed to disclose any of these analyses to the defense. Nor have they disclosed the trading dates and times Battalio has evaluated, or even the inputs and variables Battalio used in these analyses. These failings have left the defense completely unable to evaluate much of Battalio's proffered testimony or to prepare rebuttal analysis, and therefore fails the requisite admissibility standards under Rule 702 and *Daubert*. The Court should preclude Battalio's testimony on this basis alone. *United States v. Kaufman*, No. 19 Cr. 504 (LAK), 2021 WL 4084523 at *23 (S.D.N.Y. Sept. 8, 2021), *aff'd* 2023 WL 1871669 ("fail[ing] sufficiently to comply with Rule 16[]" disclosure requirements "alone warranted exclusion" of expert testimony).

D. Battalio's Proposed Price Impact Testimony Is Unfairly Prejudicial

The Court should also preclude Battalio's testimony on price impact because of the danger of unfair prejudice. Battalio proposes to present no less than nine analyses or opinions regarding the price impact of Archegos's orders:

- Battalio will present a “vector auto regression demonstrating a statistically significant relationship between Archegos’s trading imbalance...and changes in prevailing stock prices” (*Battalio Decl.* ¶ 6.c);
- Battalio will present three “micro-market price impact” analyses showing that Archegos’s orders “were large enough to clear the order book at the best bid or best ask” resulting in a change to the midpoint price (*Id.* ¶ 6.e-g);
- Battalio will present analysis showing that Archegos was likely to place orders that resulting in trades having “price impact in the direction of Archegos’s position” (*Id.* ¶ 7.d.iii);
- Battalio will opine that “Archegos’s price impact....largely moved in opposition to the price impact of the trading of other market participants” (*Id.* ¶ 7.f);
- Battalio will present a “probit regression analysis” showing that “when Archegos increased order sizes, price increases often followed” (*Id.* ¶ 7.g);
- Battalio will testify that a “disproportionate amount of Archegos’s price impact...results from trading undertaken at the beginning and end of the trading day” (*Id.* ¶ 7.h); and
- Battalio will testify that “the prices of [the stocks underlying Archegos’s positions] would not have reached or maintained the prices they held in March 2021 without Archego’s [sic] activity [sic] (*Id.* ¶ 8).”

There is no question that this price-impact testimony, under the imprimatur of an expert, will cause unfair prejudice. *See Munn v. Hotchkiss School*, 24 F. Supp. 3d 155, 199 (D. Conn. 2014) (observing that “expert testimony comes with a powerful imprimatur”). And there is extremely limited probative value, if any, to the proposed testimony since price impact is of course not manipulation. *See Set Capital LLC v. Credit Suisse Group AG*, 996 F.3d 64, 77 (2d Cir. 2021) (open-market activity “is not, by itself, manipulative . . . even when it impacts the market price for a security”); Jury Charge at 1350-51, *United States v. Phillips*, 22 Cr. 138 (“Keep in mind that the mere fact that a transaction affected market prices does not render it manipulative”). That makes sense, because “the very act of trading affects not only current prices, but also *price dynamics* which, in turn, affects future trading costs.” Estes Decl. Ex. E at 3.

The drumbeat of testimony on price impact illustrates the prosecution’s intent to conflate these two distinct points. For example, Battalio proposes to testify that the relevant stock prices “did not reflect the ordinary operation of supply and demand but rather reflected accumulated price pressure caused by Archegos’s activity.” Battalio Discl. ¶ 8. This wrongly assumes that Archegos’s swaps *did not* reflect demand. But of course they did. Archegos engaged in actual large swap transactions that exposed the fund to real market risk. The prosecution’s theory, taken to its logical conclusion, would render the large purchases of any market participant manipulative, just because they would impact price. That theory finds no basis in law.

Accordingly, the Court should exclude Battalio’s testimony on price impact.

E. Battalio’s Proposed Testimony Regarding the Price Impact of Adding or Removing a Stock from an Index is Irrelevant and Misleading

Battalio proposes to summarize academic literature that shows when a security is added to an index, such as the S&P 500, its price rises, and when a security is removed from such an index, its price falls. Battalio Discl. ¶ 6.b. He “will explain that academic research has demonstrated that the price impact derives from index fund transactions’ impact on the amount of circulating stock.” *Id.* This Court must exclude this proposed testimony for lack of relevance and the risk of misleading the jury. *Rezulin*, 309 F. Supp. 2d at 540 (expert testimony must “assist the trier of fact to understand the evidence or to determine a fact in issue”). There has been no suggestion that Archegos’s trading was motivated by whether stocks were included in indices, and as such, whether a stock’s addition to or removal from an index impacts price has no relevance to the indictment. To suggest otherwise would be misleading and unfairly prejudicial.

II. The Court Should Exclude Professor Seru’s Testimony

The Court should exclude the proposed testimony in Paragraphs 3, 5-6, and 9-11 of the Seru Disclosure for the following reasons: (a) Seru’s testimony on signals invades the province

of the jury and is speculative, unreliable, and unduly prejudicial; (b) Seru’s testimony on strategy invades the province of the jury and is speculative, unreliable, and misleading; and (c) Seru’s testimony on deceptive market practices and the subversion of supply and demand invades the province of the court and is unreliable and unfairly prejudicial.

A. Seru’s Proposed Testimony on Signals and Market Influence Invades the Province of the Jury and Is Speculative, Unreliable, and Unduly Prejudicial

Seru proposes to opine that Archegos’s orders “conveyed misleading information to the stock market” through certain “signals” in its orders. Seru Discl. ¶ 9. Seru also proposes to testify that the orders “were of sufficient price, size, volume, and frequency” to “influence the behavior of other market participants.” Seru Discl. ¶ 10. Neither opinion passes muster under a *Daubert* analysis.

First, testimony about what Archegos intended to “convey” is a patent effort to invade the province of the jury on an ultimate issue in the case: whether Mr. Hwang intended to deceive or defraud others by “send[ing] a false pricing signal to the market.” *ATSI Commc’ns, Inc. v. Shaar Fund, Ltd.*, 493 F.3d 87, 100 (2d Cir. 2007). As the Second Circuit has made clear, such testimony is improper, because it “poses a uniquely heightened danger of intruding on the jury’s function.” *DiDomenico*, 985 F.2d at 1164. Put differently, the testimony “does not aid the jury in making a decision, but rather attempts to substitute the expert’s judgment for the jury’s.” *Rezulin*, 309 F. Supp. 2d at 541 n.23.

Seru proposes to testify that Archegos’s orders “conveyed misleading information to the stock market,” and that large buy orders, like Archegos’s, signal to other market participants “that buyers have different and superior information about a security than that possessed by the market as a whole.” Seru Discl. ¶ 9. But Seru has no way of knowing what was in Mr. Hwang’s mind when he placed the trades or whether there was any intent to signal that he had different

and superior information than the market as a whole. Seru’s rank speculation on these issues is wholly improper, and it is particularly misleading in light of the multitude of documents reflecting the true motivation behind the trades: Mr. Hwang liked the companies and thought they were “cheap.” Estes Decl. Exs. K (“I love how GSX is exploring!! My target currently is \$150 given its leadership and higher margin!”); Ex. L (Viacom and Discovery have “strategic value” and prices “are too cheap”); Ex. M (noting that best content in streaming companies is in companies like Viacom and Discovery, which will “likely benefit much more than expectations”); Ex. N (Discovery is “Very Cheap!”).

Equally speculative and misleading is Seru’s testimony that (i) Archegos’s use of swaps and multiple counterparties conveyed misleading signals, and (ii) Archegos’s orders could influence the behavior of other participants in the market. Seru Discl. ¶¶ 9A-B, 10. Seru has no apparent qualifications to give this testimony, because he has no education, expertise, or experience in swaps trading or market signals and influence. *See Arista Records LLC v. Lime Group LLC*, No. 06 Civ. 5936 (KMW), 2011 WL 1674796, at *2 (S.D.N.Y. May 2, 2011) (“An expert who is qualified in one field cannot offer an opinion about aspects of the case in another field for which she is not qualified.” (internal citations omitted)). Nor does the disclosure cite any quantitative analysis or academic literature that supports how common industry practices, like the use of swaps and multiple counterparties, convey misleading signals to market participants. Indeed, taken at face value, Seru’s wholly unsupported opinion would mean that most of the big funds on Wall Street, which likewise utilize swaps and multiple counterparties, are sending misleading market signals on a daily basis. Seru’s opinions on these issues are simply *ipse dixits* that must be excluded. *See Clarke*, 2015 WL 4739978, at *5 (“Rule 702

requires that expert testimony rest on knowledge, a term that connotes more than subjective belief or unsupported speculation.”).

Moreover, these opinions are unduly prejudicial. Swaps are *legal*, and there is a \$5.2 trillion swap market involving market participants of all sorts. *See* Estes Decl. Ex. O. Using multiple counterparties is *legal*, and indeed, in the wake of the financial crisis, funds purposefully used multiple counterparties to avoid counterparty credit risk. *See* Estes Decl. Ex. P at 1301 (“To reduce counterparty risk and obtain competitive financing rates, leveraged funds typically enter swap contracts with multiple major global financial institutions simultaneously.”). Seru’s testimony that these completely normal practices conveyed misleading signals poses a high risk of unfair prejudice and jury confusion. That risk is heightened by the juxtaposition of this testimony with Seru’s proposed testimony that large buy orders can send signals to other market participants. *See* Seru Discl. ¶ 9A-C. While buy orders may be visible to other traders in the market, traders cannot see the market participant placing those orders; they can see only the market maker making the trade. Thus even if Archegos was trading entirely in stocks, rather than swaps, market participants looking for “signals” would not see Archegos’s name behind the orders on a daily basis. Seru’s testimony suggests otherwise, and for this reason, as well, it is dangerously misleading and should be excluded.

Finally, Seru’s proposed testimony on signals and market influence is unreliable because it is not based on actual market data. Seru analyzed only Archegos’s swap order records, *see* Seru Discl. ¶¶ 9-11, rather than Counterparty execution data showing how the Counterparty’s hedging trades were actually transmitted to the market. In other words, Seru did not analyze any “signals” to the market at all; he analyzed only the swap orders Archegos placed with its Counterparties.

The difference in that data is critical. For example, Seru opines that “large buy orders, repeated buying, or aggressive bidding can signal to other market participants that buyers have different and superior information about a security than that possessed by the market as a whole.” Seru Discl. ¶ 9.A. For the vast majority of Archegos’s orders, an algorithm was selected for the Counterparty to use in executing any hedges on the market. Those algorithms, by design, carve up large orders into smaller lots. *See* Estes Decl. Ex. Q at 25 (“The purpose of trading algorithms is to slice and dice parent orders to hide parent size and directional trading intentions.”). The Counterparty execution data, showing how the trades were actually transmitted to the market, is thus the only way to assess any supposed “signals” to the market. Because Seru’s testimony is not based on this data, it is inherently unreliable and misleading. The Court must exclude it.

B. Seru’s Proposed Testimony on Strategy Invades the Province of the Jury and Is Unreliable, Misleading, and Unduly Prejudicial

Seru’s opinion on strategy is nothing more than a thinly veiled closing argument as to why Hwang engaged in market manipulation. That is impermissible.

Like Battalio, Seru proposes to opine that Archegos’s orders were “consistent with a strategy to influence market prices” and “inconsistent with a strategy to build concentrated positions...at the best available prices.” Seru Discl. ¶ 11. To support that opinion, Seru proposes to testify about multiple instances “in which Archegos directed trades to counter negative news or perceived market weakness in a stock.” *Id.* ¶ 11.c.v. All of this testimony involves speculation into Mr. Hwang’s intention behind the trades. Seru has no expertise in *why* Archegos bought swaps. Seru did not work at Archegos, he has no inside knowledge of the firm, and he is not a mind-reader. To the extent he is speculating about trade motivation based on Archegos documents, such speculation is not proper expert testimony. *See R.F.M.A.S., Inc. v.*

So, 748 F. Supp. 2d 244, 268 (S.D.N.Y. 2010) (“Determining what motivated a particular person or entity is generally not an appropriate subject matter for expert testimony.”); *LinkCo, Inc. v. Fujitsu Ltd.*, No. 00 Civ. 7242 (SAS), 2002 WL 1585551, at *2 (S.D.N.Y. July 16, 2002) (excluding testimony based on an expert witness’s “secondhand knowledge” through documents).

Nor is Seru’s testimony based on any formal, recognized methodology for determining whether trades are consistent with a strategy to influence market prices as opposed to a strategy to build positions. *Lara v. Delta Int’l Mach. Corp.*, 174 F. Supp. 3d 719, 729 (E.D.N.Y. 2016) (“[W]here an expert’s testimony is bottomed upon nothing more than mere speculation and guesswork or otherwise constitutes nothing more than ‘junk science,’ the flexible *Daubert* inquiry gives the district court the discretion needed to ensure that the courtroom door remains closed”). According to Seru, the *sole* economically sensible strategy in trading is “to seek to minimize price impact.” Seru Discl. ¶ 11.B. But he is unqualified to provide this testimony given his lack of portfolio management experience or research in this area. *See Tin Yat Chin*, 371 F.3d at 40 (in reviewing an expert’s qualifications, the court must “compare the area in which the witness has superior knowledge, education, experience, or skill with the subject matter of the proffered testimony”). He has also failed to cite any literature to support this proffered testimony. Moreover, the proffered testimony is belied by the trading activities and documents of other parties in this case, as explained in detail in Part I.B.3, *supra*.

Seru likewise offers no methodology for why he deems trades “uneconomic.” *See* Seru Discl. ¶ 11. For example, he proposes to testify about yet-to-be identified days where Archegos engaged in pre-market trading, which he claims involves “reduced liquidity,” Seru Disclosure ¶ 11.C.i, but he has apparently undertaken no analysis of whether there was actually reduced

liquidity on those days. Nor does he offer any quantitative analysis of why buying and selling stock on the same day is “uneconomic,” Seru Discl. ¶ 11.C.iv, particularly when vast swathes of industry participants regularly do so to take advantage of short-term market moves. And again, Seru’s CV reflects no industry experience or academic research that would support this opinion. In other words, Seru has no methodology to support his opinion; he is just “propound[ing] a particular interpretation of a party’s conduct.” *Highland Capital Mgmt., L.P. v. Schneider*, 379 F. Supp. 2d 461, 473 n.2 (S.D.N.Y. 2005).

These flaws in Seru’s testimony also raise the specter of unfair prejudice. Seru’s testimony that trading is economically sensible *only* if it minimizes price impact obviously suggests that any trading that *does not* minimize price impact is improper. But as reflected by the documents cited in Part I.B.3 *supra*, that is not true: an investor may want to trade quickly to avoid the risk that the trade is not executed if the price rises before it can be completed. Seru’s testimony risks misleading the jury on this issue and for this reason, too, it must be excluded.

C. Seru’s Proposed Testimony on Deceptive Market Practices Invades the Province of the Court and Is Unreliable and Unfairly Prejudicial

Seru next proposes to testify about trading strategies that create market inefficiencies, such as “wash trading, cornering, and short squeezes.” Seru Discl. ¶ 6. He further proposes to testify that trading strategies “can be *deceptive* even when they involve open market transactions.” *Id.* (emphasis added). He also proposes to testify that “market participants can impair or even subvert the operation of supply and demand through market activities.” Seru Discl. ¶ 5.

Seru’s opinion that trades “can be *deceptive* even when they involve open market transactions” invades the province of the court. “As a general rule an expert’s testimony on issues of law is inadmissible.” *United States v. Bilzerian*, 926 F.2d 1285, 1294 (2d Cir. 1991).

The reason for the rule is that “[t]he special legal knowledge of the judge makes the witness’ testimony superfluous.” *Marx & Co. v. Diners’ Club*, 550 F.2d 505, 510 (2d Cir. 1977). Here, it is clear the prosecution intends to use Seru as a vehicle to state the legal conclusion that the trades in issue are “manipulative or deceptive” devices in violation of 15 U.S.C. § 78j(b). This proposed testimony is improper, because the definition of market manipulation is one for the Court, not an expert witness. *See United States v. Scop*, 846 F.2d 135, 140 & n.1, *modified on other grounds*, 856 F.2d 5 (2d Cir. 1988).

The decision in *Scop*, another market manipulation case, is instructive on this point. There, the Second Circuit reversed the convictions of two defendants based on the admission of expert testimony that “drew directly upon the language of the statute and accompanying regulations concerning ‘manipulation’ and ‘fraud.’” *Id.* at 140. The Court found that the testimony constituted “legal conclusions that were highly prejudicial and went well beyond his province as an expert in securities trading.” *Id.* In doing so, the Court emphasized that the words used by the expert, such as “manipulation,” “scheme to defraud,” and “fraud,” were “the subject of diverse judicial interpretations,” and expressed concern about the expert’s “repeated use of statutory and regulatory language indicating guilt.” *Id.* at 141-42.

Similarly here, Seru’s proposed testimony about what market behaviors are “deceptive” improperly intrudes on the Court’s role in instructing the jury. The word “deceptive” comes directly from the relevant statutory language, *see* 15 U.S.C. § 78j(b), which requires the prosecution to prove a “manipulative or deceptive device,” and its meaning is typically addressed in jury instructions on securities fraud. An expert opinion on what market practices are deceptive would be highly prejudicial and tantamount to a directed verdict. Accordingly, it must be excluded.

The disclosure also lacks sufficient bases and reasons for these opinions: (i) there is no explanation of *how* market activities can impair or subvert the operation of supply and demand or be deceptive; (ii) there is no disclosure of the literature that supports these opinions; and (iii) Seru’s CV does not reflect experience or academic research that would support these opinions. Put simply, Seru’s disclosure lacks any explanation as to how he came to these opinions and what supports them. *See United States v. Ray*, 583 F. Supp. 3d 518, 544 (S.D.N.Y. 2022) (expert testimony must be excluded where its proponent “would have the jury accept it not because of any expertise [the expert] applied to the evidence or because of his methodology but solely because, as an expert, he is saying it”). Accordingly, this is the type of “speculative or conjectural” testimony that fails to satisfy Rule 702. *See Boucher*, 73 F.3d at 21.

III. The Court Should Exclude Carmen Taveras’s Testimony

The Court should exclude the proposed testimony of Carmen Taveras for several reasons: (a) her proposed testimony on the purported relationship between Archegos’s swaps positions and the market prices of the subject securities lacks the foundation required under Second Circuit precedent and risks misleading the jury; (b) her attempt to “associate” Archegos’s trade orders in swaps with trades in the equities market, in the absence of Counterparty execution data, is unreliable (and therefore misleading); (c) her proposed comparison of Archegos’s swap positions with the outstanding shares of the referenced securities is both irrelevant and misleading; and (d) her speculative testimony about “why companies may choose” to have a seasoned equity offering is irrelevant and an improper attempt to circumvent the actual facts about the Viacom offering at issue in this case.

A. Taveras's Proposed Testimony on the Purported Relationship between Archegos's Swap Positions and Market Prices Lacks Foundation and Risks Misleading the Jury

Like Battalio (*see* Part I.A, *supra*), Taveras plans to link Archegos's swap positions with market prices for securities without analyzing any other factors that contributed to those prices. This testimony is plainly improper under *Ferguson*.

Specifically, she proffers the following testimony:

- *First*, Taveras proposes to testify that “as Archegos increased its exposure through swaps to the Top Archegos Securities, the market price of the Archegos Top Long Positions increased” and that “the performance of the Archegos Top Long Positions generally exceeded the relevant market and industry ETFs.”⁵ Taveras Discl. ¶ 4.D.
- *Second*, Taveras proposes to testify that “as Archegos set limit prices for the Archegos Top Positions, the prevailing market prices for the Archegos Top Positions quickly followed the limit prices set by Archegos in the end-of-day trading period, on multiple [non-specified days] between July 2020 and March 2021” and likewise in “the pre-market trading period, on multiple [non-specified] days between January 2021 and March 2021.” *Id.* ¶¶ 6, 7. She intends to opine that the “pattern of limit price followed by a rise in market price to meet it across multiple [unspecified] observations and multiple [unspecified tickers] is highly unusual, indicative of market influence. *Id.*- Third, Taveras plans to “present a comparative analysis” showing that “when Archegos’s holdings increased, the market prices for the Archegos Top Holdings increased as well” and “when Archegos went into liquidation in the end of March 2021, the prices of Archegos Top Long Positions fell” and did not recover.” *Id.* ¶ 9.

As set forth more fully above, (*see* Part I.A), in the absence of an event study or similar analysis showing that the impact on the price of the subject securities was *caused* by Archegos’s

⁵ “Exchange-traded funds (ETFs) are SEC-registered investment companies that offer investors a way to pool their money in a fund that invests in stocks, bonds, or other assets. In return, investors receive an interest in the fund.” *Introduction to Investing Glossary: Exchange-Traded Fund (ETF)*, U.S. SECURITIES AND EXCHANGE COMMISSION, <https://www.investor.gov/introduction-investing/investing-basics/glossary/exchange-traded-fund-etf>.

trading or the size of its positions, as opposed to other confounding factors, the prosecution cannot invite the jury to infer that such a relationship exists. *See Ferguson*, 676 F.3d at 274-75 (reversing conviction where stock price drop chart admitted without adequate expert foundation); *Martoma*, 993 F. Supp. 2d at 458 (event studies are necessary to analyze whether “events can be linked in a statistically significant way to variations in stock price”).

Here, Taveras has failed to undertake any quantitative or statistical analysis to determine the *cause* for stock prices increases, and whether those increases were due to Archegos or other market forces. Taveras Discl. ¶ 4.D. This is improper under *Ferguson*, and it is incredibly misleading and prejudicial. Myriad market forces affected stock prices in 2020 and 2021. For example, the COVID pandemic led to increased stock prices in companies that benefited from the stay at-home-environment, such as streaming companies, and the GameStop movement caused extreme volatility in the stock prices of certain companies, including some of the at-issue securities. Taveras’s testimony takes none of that into account, and as a result, creates a real danger of misleading the jury.

Much of her other proposed testimony suffers the same flaw. For example, the proposed testimony on Archegos’s use and “pattern” of limit prices, and the purported impact on market prices, is wholly conclusory and lacks any disclosed analysis. *Id.* ¶¶ 6, 7. Likewise, her vague opinion that certain limit and market price activity was “highly unusual” (*id.* ¶ 6) is unsupported by literature of any kind, let alone a statistical or quantitative analysis that would give the term “unusual” any meaning. She also fails to provide a baseline for comparison. *See id.* Even more egregious, Taveras’s proposed testimony showing that the stock prices of Archegos Top Long Positions did not recover after Archegos’s collapse (*see id.* ¶ 9) is precisely the type of baseless and misleading expert testimony *Ferguson* precludes. 676 F.3d at 274-75. Indeed, the

prosecution recognized the problem with this type of “after-the-fact price evidence” just a few months ago in the *Phillips* market manipulation case, where they argued:

After-the-fact price evidence is irrelevant and highly likely to mislead the jury. ... What part of the subsequent price movements happened because of [the defendant]? What part happened because of political events? What part happened because of changes in demand for the [asset at issue]? These and other complicated economic question[s] ... require careful econometric analysis to be proper excerpt [sic] testimony. . . .

Mem. of Law in Support of Mot. *in Limine* of the United States at 12, *United States v. Phillips*, No. 22 Cr. 138 (LJL) (S.D.N.Y. Sept. 29, 2023), ECF No. 41 (internal citations omitted). Under the prosecution’s own rubric, Taveras’s testimony fails, because she offers no such “careful econometric” analysis here. *See* Taveras Discl. ¶ 9; *In re Bear Stearns Cos., Inc. Sec., Derivative, and ERISA Litig.*, 909 F. Supp. 2d 259, 269 (S.D.N.Y. 2012) (“[A] drop in a company’s stock value may be the result of a wide variety of factors other than fraud.”). Her proposed testimony regarding the purported relationship between Archegos’s swap positions and trading activity and the market prices for the subject securities must be excluded.

B. Taveras’s Proposed Testimony Associating Archegos’s Trades with Equity Market Transactions Is Unreliable and Risks Misleading the Jury

Taveras proposes to testify that “Archegos trade orders in swaps in the Top Archegos Securities can be associated with equity transactions in the National Market System.” Taveras Discl. ¶ 5. Any such testimony should be excluded because it is unreliable and risks misleading the jury.

First, the prosecution’s disclosure fails to provide any explanation of how Taveras formed her opinion. *See* Taveras Discl. ¶ 5. As stated in Part I.C, the prosecution has not obtained full hedging records from the Counterparties. Without empirical data showing how the Counterparties hedged Archegos’s swaps with equity transactions, Taveras can do no more than

guess that certain equity transactions in the National Market System are associated with Archegos's trade orders in swaps. *See Major League Baseball Properties, Inc. v. Salvino*, 542 F.3d 290, 329 (2d Cir. 2008) (expert whose "opinion was based not on factual evidence but on 'guesses'" properly excluded); Fed. R. Evid. 702(b) (expert testimony must be "based on sufficient facts or data").

Further, Taveras's conclusion that Archegos's swap orders "can be associated with" equity transactions in the National Market System is not based on a reliable methodology. *See Riegel*, 451 F.3d at 127 (expert must explain "how the expert came to his conclusion and what methodologies or evidence substantiate that conclusion"); Fed. R. Crim. P. 16(a)(G)(iii) (disclosure must contain "bases and reasons"). The prosecution's disclosure states that Taveras formed her opinion "by matching price, quantity, and time from the Archegos Order and Execution Records to the NYSE Daily TAQ Data." Taveras Discl. ¶ 5. But as explained in Part I.C, *supra*, the trade blotter reflecting Archegos's swap order does not include the data needed to undertake this analysis, rendering it unreliable.

Worse yet, the prosecution's disclosure fails to identify which trades Taveras evaluated, what methodology she employed in determining that certain transactions are "associated," or even which transactions she believes are "associated." Taveras Discl. ¶ 5. Without any specific information about Taveras's analysis, the defense has no way of testing her conclusory opinions. *See Buckley v. Deloitte & Touche USA LLP*, 888 F. Supp. 2d 404, 413-14 (S.D.N.Y. 2012) (rejecting expert testimony where expert "report[ed] no factors that he considered ... or even what methodology he employed").

C. Taveras’s Proposed Testimony Comparing Archegos’s Swap Exposures to Outstanding Shares Is Irrelevant, Prejudicial, and Risks Misleading the Jury

Taveras proposes to “present a comparison of Archegos’s total exposure to the securities of an issuer and compare that to the issuer’s shares outstanding.” Taveras Discl. ¶ 4.B. This comparison is not relevant and, in any event, should be excluded under Rule 403.

Taveras’s proposed testimony is irrelevant because there is no relationship between Archegos’s total swap exposure to the securities of an issuer and an issuer’s outstanding shares. In executing swap transactions, Archegos was not trading in, nor directly affecting the number of shares in circulation. Fed. R. Evid. 401 (evidence is irrelevant if it has no “tendency to make a fact more or less probable”).

More importantly, even if Taveras’s testimony had any probative value, that value would be substantially outweighed by the danger of unfair prejudice and juror confusion. *See* Fed. R. Evid. 403. The prosecution’s claim that Archegos dominated the float of the at-issue securities rests on the assumption that the Counterparties hedged positions on a one-to-one basis for the duration of the swap. But documents produced in discovery show the Counterparties did not do so. For example, an email in one Counterparty’s production indicates that the Counterparty was “giving [Archegos] exposure to 9.50% of the company,” even though “[the Counterparty]’s physical ownership of the stock is 5.5%.” Estes Decl. Ex. R. Similarly, filings available through the United States Securities and Exchange Commission’s (“SEC”) Electronic Data, Gathering, and Retrieval System (“EDGAR”), show that Archegos’s economic exposure to swaps was greater than other Counterparties’ physical holdings. *See* Reply Brief in Support of Motion for Rule 17(c) Subpoenas at 10 (ECF 85). All of these documents—which the prosecution did not provide to Taveras—demonstrate the fallacy of this assumption.

Accordingly, Taveras's proposed comparison showing Archegos's swap exposure as a percentage of shares outstanding raises a danger that the jury will incorrectly infer that Archegos owned the stated percentage of shares in equity or effectively withdrew those securities from circulation by virtue of their swap positions. Neither is true. And the prosecution cannot plug this hole in their case by inviting the jury to infer otherwise based on misleading expert testimony. *See Shatkin v. McDonnell Douglas Corp.*, 727 F.2d 202, 208 (2d Cir. 1984) (expert testimony properly excluded where expert "compared [the] discounted present value with [party]'s *undiscounted* projected consumption" because "such an 'apples and oranges' comparison . . . would probably have hopelessly confused and misled the jury").

D. Taveras's Proposed Testimony Regarding a Company's Views on Share Prices at the Time of a Secondary Equity Offering Is Irrelevant and Contradicted by the Prosecution's *Brady* Disclosures

Finally, Taveras proposes to testify regarding "some of the reasons why companies may choose to have a seasoned equity offering, including a belief that their share price is overvalued." Taveras Discl. ¶ 10. The Court should exclude this discussion because it is irrelevant and does not require expert testimony.

Taveras's proposed testimony is a clear effort to establish that Viacom believed its share price was overvalued and to avoid calling a Viacom witness who will contradict that contention. Taveras proposes to use "academic research and a review of analyst reports" to opine *generally* that some companies choose to have secondary offerings because of a belief that their share price is overvalued. Taveras Discl. ¶ 10. But what companies generally consider in making a seasoned equity offering is irrelevant. Documents produced by the government demonstrate that *Viacom* did not consider its share price when announcing a secondary offering. Rather, by March 2021, "Viacom [had] developed a new strategy around streaming products" and "needed additional capital to create and market new content." *See* Prosecution's *Brady* Disclosures, dated

October 19, 2022, at 28. The prosecution may not use speculative expert testimony to circumvent facts that are contrary to its position. *See Supply & Bldg. Co. v. Estee Lauder Intern., Inc.*, No. 95 Civ. 8136 (RCC), 2001 WL 1602976, at *5 (S.D.N.Y. Dec. 14, 2001) (expert testimony that contradicted available records was not reliable).

IV. The Court Must Exclude Joseph Mason’s Testimony

The prosecution’s Disclosure of Joseph Mason (Estes Decl. Ex. D) suffers from many of the same problems as the prosecution’s other proposed experts, and should be excluded for the same reasons: (a) Mason makes the same improper attempt to violate Rule 704 and testify to Mr. Hwang’s state of mind by opining that Mr. Hwang’s behavior was “consistent with” or “inconsistent with” a particular investment “strategy”; (b) Mason’s comparison of Bloomberg chats to market data lacks a reliable methodology; and (c) Mason repeatedly fails to disclose the bases and reasons for his opinions, relying on nothing but his own *ipse dixit* to support opinions concerning Archegos’s portfolio needs in March 2021, the proper approach to conducting a DCF analysis, and Archegos’s ability to unwind its market positions.

A. Mason’s Proposed Testimony on Strategy Invades the Province of the Jury

As with Battalio, Seru, and Taveras before him, Mason attempts to improperly testify as to Mr. Hwang’s intent. For example, he opines that, “on March 23, 2023 and March 24, 2023, Archegos’s trading generally, and Hwang’s directives specifically, were *inconsistent with a strategy* to sell down positions to pay for margin calls or to reduce the portfolio’s market exposures and *consistent with a strategy* to impact the prevailing market prices of the traded securities and thereby avoid margin calls.” Mason Discl. ¶ 9 (emphasis added). This thinly veiled attempt to testify to Mr. Hwang’s intent by “couch[ing it] in terms of industry practices” must be rejected. *Highland Capital Mgmt., L.P. v. Schneider*, 551 F. Supp. 2d 173, 182-83

(S.D.N.Y. 2008) (excluding expert testimony on defendants’ beliefs about the value of a particular investment).

As with the prosecution’s other experts, Mason has no expertise in *why* Mr. Hwang and Archegos traded in the ways that they did on March 23 and March 24, 2023. Mason did not work at Archegos or otherwise gain inside knowledge of the firm, and, like his co-experts, he apparently “has not yet invented a way to read minds.” *AU New Haven, LLC v. YKK Corp.*, No. 15 Civ. 3411 (GHW) (SN), 2019 WL 1254763, at *13 (S.D.N.Y. Mar. 19, 2019), *adopted in relevant part*, 2019 WL 2992016 (S.D.N.Y. Jul. 8, 2019); *see also Rezulin*, 309 F. Supp. 2d at 546-547 (inferences about intent or motives of parties “lie outside the bounds of expert testimony” because they “have no basis in any relevant body of knowledge or expertise”). His opinion is thus nothing more than speculation based on his review of the documents, and must be excluded. *See Clarke*, 2015 WL 4739978, at *5 (“Rule 702 requires that expert testimony rest on knowledge, a term that connotes more than subjective belief or unsupported speculation.” (internal citation omitted)).

Likewise, in Paragraph 11, Mason again improperly proposes to testify to Mr. Hwang’s intent while trading. As in Paragraph 9, Mason’s disclosure states that he will opine that Mr. Hwang “provided trading directives to the Archegos trading team that were *inconsistent with* a long-term or value-based *approach* to investing and were *consistent with* a trading *strategy* to maximize price impact.” Mason Discl. ¶ 11 (emphasis added). Describing Mr. Hwang’s trading as “consistent with” or “inconsistent with” a particular “approach” or “strategy” is merely “semantic camouflage” for Mason to opine to the jury that Mr. Hwang intended to trade in a particular manner for a particular reason. *DiDomenico*, 985 F.2d at 1165 (“We read [the

expert]’s proffered testimony as stating the bottom-line inference, and leaving it to the jury merely to murmur, ‘Amen.’”).

Mason doesn’t even camouflage his later proffered testimony on intent: he states he will identify “[i]nstances in which *Hwang directs trades* to counter negative news or perceived market weakness in the stock.” Mason Discl. ¶ 11 (emphasis added). This testimony transparently goes to *why* Mr. Hwang ordered a certain trade. It plainly violates Rule 704 and must be excluded.

B. Mason’s Proposed Testimony Comparing Archegos’s Instant Bloomberg Chats Lacks a Factual Predicate and Reliable Methodology

The prosecution proposes to have Mason, based on a review of Instant Bloomberg chats between Mr. Hwang and the traders at Archegos, along with various sources of market data, “identify market activity, such as price, volume, bids, and offers, occurring at contemporaneous moments during [the Instant Bloomberg chats].” Mason Discl. ¶ 10. Strangely, the prosecution offers no purpose for this exercise, and there is no indication that Mason intends to state any particular opinion about it. It is therefore hard to see how Mason’s purported comparison of internal Archegos chats and broader market activity could “help the trier of fact to understand the evidence or to determine a fact in issue.” Fed. R. Evid. 702(a).

To the extent that the prosecution seeks to revise Mason’s disclosure to opine that the identified market activity was caused by or otherwise tied to the trading discussions occurring between Mr. Hwang and the Archegos traders, Mason lacks a proper factual predicate or reliable methodology to state such an opinion. As discussed above in depth with respect to Battalio and Seru (*see* Part I.C), “there is simply too great an analytical gap between the data and the opinion proffered.” *Gen. Elec. Co.*, 522 U.S. at 146. Without trading records of how the Counterparties hedged their swap trades with Archegos—records the prosecution specifically opposed the

defense's efforts to obtain—Mason can only speculate as to any association between Archegos's chat activity and trades in the market. Such speculation and conjecture must be excluded. *See Boucher*, 73 F. 3d at 21; *Clarke*, 2015 WL 4739978, at *5 (“Rule 702 requires that expert testimony rest on knowledge, a term that connotes more than subjective belief or unsupported speculation.”) (internal citation omitted); *United States v. Zafar*, 291 F. App'x 425, 427 (2d Cir. 2008) (upholding district court's exclusion of expert testimony as “well within its discretion” where testimony lacked a “critical missing link” for relevance).

C. Mason's Proposed Testimony on Archegos's Portfolio Needs in March 2021 is Unreliable and Fails to Disclose its Bases and Reasons

Mason proposes to opine that, in light of Archegos's risk profile in March 2021, “Archegos would have needed to access to [sic] significant liquid assets to ensure the ability to continue operations in the event of a price decline in one of the portfolio's top positions.” Mason Discl. ¶ 7. This opinion, based on nothing but Mason's own say-so, is unreliable and should be excluded. *See Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (“[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.”).

Mason's disclosure provides no indication of the bases for his opinion, and identifies no analysis that he conducted to support his conclusions. Mason points to no industry standards for risk, nor does he otherwise try to quantify his opinion in any way. Rather, he simply asserts that Archegos would have needed “significant liquid assets” to survive a “price decline” in one of its top positions. It is unclear what point Mason is trying to make and how it could possibly assist the jury in carrying out its duties because Archegos did, in fact, have significant liquid assets—over \$6 billion in cash or excess margin at Counterparties—at the beginning of the week of the collapse. The Court should therefore exercise its gatekeeping authority to exclude Mason's

unsupported and irrelevant opinion. *See Riegel*, 451 F.3d at 127 (“An expert opinion requires some explanation as to how the expert came to his conclusion and what methodologies or evidence substantiate that conclusion.”).

D. The Prosecution Has Failed to Disclose the Bases and Reasons for Mason’s Opinion on DCF Analysis

In Paragraphs 1.q and 2 of his disclosure, Mason describes a DCF analysis, which he defines as “a method for estimating the current value of a company based on projected future cash flows adjusted for the time-value of money.” Mason Discl. ¶ 1.q. Mason then opines that “it is not standard to undertake a results-driven valuation analysis,” and that “[a]djusting the parameters in a DCF model to produce a desired output is an example of results-driven valuation analysis.” Mason Discl. ¶ 3. The Court should exclude this proposed opinion for failure to state its “bases and reasons.” Fed. R. Crim. P. 16(a)(1)(G)(iii). Mason points to no academic literature, industry research, or personal investment experience to support his position that it is “not standard” to conduct a DCF analysis by “[a]djusting the parameters in a DCF model to produce a desired output.” Such “‘*ipse dixit* of the expert’ from experience” cannot satisfy Rule 16. *United States v. Mrabet*, No. 23 Cr. 69 (JSR), 2023 WL 8179685, at *2 (S.D.N.Y. Nov. 27, 2023) (expert opinion based merely on expert’s “training, education, and experience” constituted “a patent evasion of the Rule’s requirements”).

E. The Prosecution Has Failed to Disclose the Bases and Reasons for Mason’s Analysis on Unwinding Archegos’s Positions

Mason states that he will “present analysis and graphical representations to summarize and quantify, between March 2020 and March 2021, (a) how many trading days would have been necessary to unwind Archegos’s positions at a given percentage of daily trade volume, (b) how those figures changed over time, and (c) how those figures compared to Archegos’s internal computations relating to the trading days necessary to unwind the portfolio at given percentages

of market volume.” Mason Discl. ¶ 5. According to his disclosure, this analysis is based on Mason’s “personal and professional experience,” as well as Archegos trading records and “tail unwind analyses,” and public trading records. *Id.*

Such vague, high-level summaries are insufficient. Far from disclosing the “bases and reasons” for Mason’s opinion, the government merely presents “the *ipse dixit* of the expert.” *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). Mason’s disclosure provides no insight into the nature of his analysis, making it impossible for the defense to evaluate it in advance of trial. Instead, he leaves the defense to guess how he might analyze 13 months of trading records across 12 securities. More is required. *See Riegel*, 451 F.3d at 127.

CONCLUSION

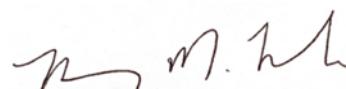
For the above-stated reasons, Mr. Hwang respectfully requests that the Court grant his motion to exclude the prosecution’s proposed expert witnesses Robert Battalio, Amit Seru, Carmen Taveras, and Joseph Mason.

Dated: December 19, 2023

Respectfully submitted,

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